WHAT IS CLAIMED IS:

1. An alignment structure for aligning a camera, the camera including a plurality of focusing members and a common focal plane array of a plurality of detectors, the alignment structure comprising:

a light source, operative to generate a light beam suitable for spectral characteristics of the camera;

a collimator, operative to collimate the light beam into a collimated light spot with a predetermined dimension; and

a multiple-beam generator, operative to split the light beam into a plurality of collimated component light beams converging on the camera at angles within field of view of the camera.

2. The alignment structure of Claim 1, wherein the predetermined dimension is larger than one pixel and smaller than three pixels of the camera.

3. The alignment structure of Claim 1, wherein the multiple-beam generator further comprises:

a platform;

a central aperture perforating through a center of the platform, wherein the central aperture has a dimension smaller than the predetermined dimension of the collimated light spot;

a plurality of peripheral apertures perforating through the platform about the central aperture;

a plurality of central mirrors mounted on the platform between the central aperture and the peripheral apertures; and

a plurality of peripheral mirrors mounted on a periphery of the platform around the peripheral apertures.

4. The alignment structure of Claim 3, wherein the central aperture of the multiple-beam generator is aligned with centroid of the collimated light spot to form a central component of the collimated light spot incident on the focusing members of the camera.

5. The alignment structure of Claim 4, wherein each of the central mirrors is oriented and positioned to split an edge portion of the collimated light spot into a plurality of peripheral components and reflect the peripheral components onto the corresponding peripheral mirrors.

6. The alignment structure of Claim 5, wherein the peripheral mirrors are adjusted and oriented to reflect the peripheral components to propagate through the peripheral apertures and converge at the camera.

7. The alignment structure of Claim 1, further comprising a kinematic stage for disposing the focusing members of the camera thereon.

8. The alignment structure of Claim 7, wherein the kinetic stage is operative to translate and rotate the focusing members with 6 degrees of freedom.

9. A single-element multiple-field camera system, comprising:

a camera, comprising:

a plurality of focusing members; and

a common focal plane array of a plurality of detectors of the focusing members;

and

an alignment structure, comprising:

a light source, operative to generate a light beam suitable for spectral characteristics of the camera;

a collimator, disposed along an optical path of the light beam generated by the light source; and

a multiple-beam generator, disposed along an optical path of the light beam propagating through the collimator.

10. The camera system of Claim 9, wherein the focusing members are integrated into a single slab of material.

11. The camera system of Claim 10, wherein the material includes silicon.

12. The camera system of Claim 9, wherein the collimator is operative to collimate the light beam generated by the light source into a collimated spot light with a dimension larger than one detector and smaller than three detectors of the focal plane array.

13. The camera system of Claim 9, wherein the multiple-beam generator comprises:

a platform disposed perpendicular to propagation of the collimated spot light;

a central aperture perforated through the platform and aligned with centroid of the collimated spot light;

a plurality of first mirrors mounted on the platform, the first mirrors being positioned and oriented to split an edge portion of the collimated spot light into a plurality of peripheral components;

a plurality of peripheral apertures perforating through the platform around the central aperture; and

a plurality of second mirrors mounted on the platform, the second mirrors being positioned and oriented to reflect the peripheral components to propagate through the peripheral apertures and converge at the camera.

14. An alignment structure for a camera including a plurality of focusing members and a common focal plane array of a plurality of pixels, the alignment structure comprising:

a light source for generating a light beam suitable for spectral characteristics of the camera;

a collimator for collimating the light beam into a light spot with a predetermined dimension; and

a multiple-beam generator for splitting the light spot into one central component and four peripheral components incident on the focusing members, such that one central spot image and four peripheral spot images are formed on the focal plane array for each focusing member; and

a kinematic stage for translating and rotating the focusing members to align the central and peripheral spot images formed by one focusing member with the central and peripheral spot images formed by another focusing members.

15. The alignment structure of Claim 14, wherein the multiple-beam generator is operative to generate the central and peripheral components converging at the focusing members within field of views of the focusing members.

16. An alignment method for a camera with a multiple-element lens and a focal plane array of pixels, comprising:

generating a light beam;

collimating the light beam into a light spot with a predetermined dimension;

split the light spot into one central component and a plurality of peripheral components about the central component;

capturing multiple fields of images by the focal plane array, wherein each field includes one central spot image and a plurality of peripheral spot images; and

translating and rotating the multiple-element lens to focus the central and peripheral spot images for each field and minimize distances of the corresponding spot images between different fields.

17. The alignment method of Claim 16, wherein the step of generating a light beam includes generating a light beam in accordance with spectral characteristics of the camera.

18. The alignment method of Claim 16, wherein the step of collimating the light beam includes collimating the light beam into the light spot with a dimension larger than one pixel and smaller than three pixels of the camera.

19. The alignment method of Claim 16, wherein the step of splitting the light spot further includes converging the central and peripheral components at the multiple-element lens with angles within field of view of the camera.

20. The alignment method of Claim 17, wherein the step of translating and rotating the multiple lens comprises:

a) translating the multiple-element lens along a first direction for coarsely focusing the spot images;

b) rotating the multiple-element lens about the first direction for minimizing distance of the central spot images between the fields;

c) translating the multiple-element lens along a second direction and a third direction perpendicular to the first direction for offsetting difference of origins between fields;

d) rotating the multiple-element lens about the first direction for refining alignment of the central spot images between the fields;

e) rotating the multiple-element lens about the second direction to minimize distance of the peripheral spot images captured along the second direction between the fields;

f) rotating the multiple-element lens about the third direction to minimize distance of the peripheral spot images captured along the third direction between the fields; and

g) translating the multiple-element lens along the first direction for further focusing the spot images.

21. The alignment method of Claim 20, further comprising repeating steps (d) to (f) until the distances of the central spot images and the peripheral spot images between the fields are within a predetermined tolerance.

22. The alignment method of Claim 21, wherein the predetermined tolerance is 1/10 pixel.

23. The alignment method of Claim 22, further comprising repeating step (g) until the spot images are focused within a predetermined tolerance.

24. An alignment method for a multiple-field single-element camera with a common focal plane, comprising generating a plurality of spot images for each field of the camera from the same light source and aligning the camera by minimizing distances of corresponding spot images between the fields.